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joint is plainly longer than wide when viewed on the lower convex face, the claw-like appendage short. The species is widely distributed, the following localities being represented in the material studied. Massachusetts; Rhode Island; New Jersey; Indiana; Illinois; Kentucky; Kansas; Arkansas; Texas.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF OCTOBER 1, 1912.

A regular meeting of the New York Entomological Society was held October 1, 1912, in the American Museum of Natural History, at 8.15 P. M., President Dr. Raymond C. Osburn in the chair and seventeen members present.

Mr. Sherman spoke of his visit to the White Mountains in September, and said that below the tree line the collecting was the poorest he had ever experienced, due probably to the cold, wet summer. Above the tree line, however, the pools among the rocks yielded as many water beetles as in former years, and judging from one day spent on the summit, the number of *Carabidæ* under stones was as great as ever. Captures of special interest were *Scutop-terus angustus*, found in Star Lake above the tree line, previously known from Hermit Lake below the tree line, *Hydroporus oblongus*, also found in Star Lake and previously known from Winnipeg, and *Patrobis rugicollis*, a species peculiar to the White Mountains, found under stones along both branches of Peabody River. Mr. Sherman spoke of the increasing number of visitors to the White Mountain camps and the greater facilities afforded by the new camp in the Great Gulf, 3,100 feet above sea level, and the addition to the Madison Hut, which now consists of two buildings, one used for cooking while the other is reserved for sleeping. Mr. Sherman recommended the Glen House as headquarters for entomological work in the White Mountains, on account of the numerous trails, which, including the new Davis and the Six Husbands' trail, make many different parts of the mountains accessible.

Mr. Engelhardt spoke of his six weeks' experiences in Newfoundland and Labrador, part of the time in company with Mr. Leng. Four principal stations were visited in Newfoundland, namely Port aux Basques, Bay St. George and Bay of Islands on the west coast, and Spruce Brook about fifty miles inland. At the first, Port aux Basques, where the first view of Newfoundland from the steamer *Bruce* shows granitic mountains a thousand feet high, very barren and with large patches of snow in July, no satisfactory hotel was found. A mile and a half north on the railroad a stopping place was found at Channel, a small fishing village, situated amid extremely boreal conditions, where pools among the rocks yielded species akin to those of Labrador. The Cape Ray Mountains in the immediate vicinity make a natural barrier against fog and

cold wind, and ten miles beyond them at Cape Ray lighthouse much milder conditions were found, with tiger beetles, Orthoptera and forests of spruce and birch on the mountainside.

At the second station, Bay St. George, very comfortable quarters were found in Martin's Log Cabin Hotel, at Stephenville Crossing, with a greater variety of environment and better collecting than at any other place visited on the west coast. The bay is surrounded by extensive sandy areas, in which three species of tiger beetles were found. The limestone Table Mountain is accessible with *Cychrus nitidicollis* living on its sides and *Trechus* and *Bembidium* in the leafy mold accumulated in the cold pits of its gypsum cliffs. A little northward on the railroad rich forests and sphagnum bogs are encountered. The nights were too cool for good results at sugar and light, although beetles were attracted by bottles with sugar mixture, including the rare *Miscodera arctica*. The diurnal Lepidoptera, however, included many northern forms of interest, like *Papilio turnus* in its northern form, *Papilio asterias* variety *brevicauda*, *Lycana pseudargiolus*, northern form, *Lycana scudderi*, *Chionobas*, etc., attracted with hosts of Diptera and Hymenoptera to the numerous wild flowers.

At the third station, Bay of Islands, comfortable quarters were found at Fisher's Hotel, Humbermouth, and the same northern species were found, but on account of the absence of sand, perhaps, no tiger beetles. Night work was tried again here, but it was too cold and rainy for good results. The methods most productive were turning stones, logs, etc., and sifting. One field was found not closely cropped by sheep, and there the sweeping was excellent.

The fourth station was not visited until the return from Labrador, when a week in the middle of August was spent at the Log Cabin Hotel at Spruce Brook on George's Pond. It was too late for diurnals, which in fact were often found faded and torn while at Stephenville, between July 10 and 15, but the night collecting at sugar and light seemed excellent, and 75 to 100 specimens were caught nightly. This locality was more inland, about fifty miles from the coast and protected by ranges about 1,500 feet in height. Along the railroad track for miles, wild flowers were plentiful and yielded many insects; thickets of alder, forests of spruce and birch, a sphagnum bog at the end of the pond and the shores of the pond itself all afforded good and varied collecting, while a path cut through the woods made an ideal spot for sugaring.

In addition to these four stations, at each of which several days were spent, short stops were made, as the Labrador steamer made calls at Port Saunders and at Port aux Choix, near the northern end of Newfoundland, and by sweeping the flowers of the cow parsnip and examining the contents of the net later, considerable numbers of Diptera were obtained.

Continuing, Mr. Engelhardt described the trip from Newfoundland to Labrador and the eight days spent in the latter country, housed with Mr. John Croucher, at Battle Harbor. Temperature ranged between 40 and 50 degrees. One afternoon was fairly clear, but it was foggy or rainy all the rest of the time. During the one clear afternoon, the little blue butterfly was fairly common, and a *Chionobas* and some Geometers were taken. Otherwise collecting was

confined to grubbing and water net. Beetles were found under stones, boards, and especially by sifting the old leaves of willow and birch, which, growing only recumbent against the rocks, sheltered small masses of dry leaves among and beneath their branches. Many species of Carabidæ, Staphylinidæ and a few representatives of other families, Elateridæ, for instance, were thus found, occasionally Geometridæ and Diptera were found in crevices of the rocks and other shelters. Battle Harbor is on an island with hardly any bushes and no trees, but many flowers, 50 or 60 species having been gathered during the week; the soil is constantly wet from the failure of the short summer to entirely thaw the ground, and there are many ponds. The snow, which in Newfoundland lay on the mountain sides in July, here extended to sea level, exerting a retarding influence on the vegetation. Willows in winter state were found beneath the snow, while ten feet from the edge of the snow bank the same were in bloom and twenty-five feet away gone to seed. Carabidæ were found abundantly under stones close to the snow.

In conclusion, Mr. Engelhardt said this northern region fulfilled his expectations, and by the use of native woolen socks and native footwear he had kept in good health despite much exposure to cold, fog, rain and soaking bogs. At Bay St. George especially the personal comfort was great, as well as the collecting excellent.

Dr. Felt, under the general title of experiences during 1912, mentioned the receipt of galls of *Neuroterus saltitorius* Hy. Edw. from Michigan, and the perceptible crepitation produced by the active larvæ; the finding of six puparia, probably *Biomyia georgiæ* B. & B., under the wing covers of *Calosoma calidum* Fabr., and the extraordinary abundance of larvæ and adults of the two-spotted lady beetle, *Adalia bipunctata* Linn. He spoke briefly of collecting *Platypus punctulatus* Chap., kindly identified by Dr. Hopkins, from mahogany logs in Long Island City and the attack by this insect on freshly sawn sappy mahogany boards. This beetle, it was estimated at that time, caused a loss of \$200 per day. The occurrence of six specimens of *Seius*, a fair-sized mite, on *Helobia punctipennis* Meign. was noticed. Recent work in rearing *Phormia regina* Meign. and *Sarcophaga georgina* Weid. resulted in determining the period occupied by the various larval instars and showed that the maggots, especially the older ones, were negatively heliotropic. Specimens received during the year enabled him to identify adults of *Uleelia* Rubs. previously known only in the larva. A full discussion of this genus is given in Entomological News, 23: 353-54, 1912. *Itonida inopis* O. S. was reared from swollen scrub pine twigs and its specific distinctness established (Econ. Ent. Journ., 1912, 5: 368-69). Similarly, *Cecidomyia aceris* Shimer was reared by J. S. Houser in Ohio and proved to be a species of *Rhabdophaga*.

Mr. Davis spoke of the many places on Long Island he had visited during the summer, and showed by photographs the abundance of the red admiral butterfly and the capture of one by a spider.

Mr. Davis also spoke of the pink forms of katydids (*Amblycorypha oblongifolia*) and methods of preserving the color, and said that five specimens had been found during the past summer, including one male.

Mr. Engelhardt also exhibited a pink specimen of the same species, also a male, collected in the salt marshes near Woodhaven, L. I.

Mr. Grossbeck said that apparently the pink forms of katydid were unusually abundant this year, and placed on record three more, namely, one *Amblycorypha rotundifolia*, female, collected at Cedar Grove, Essex County, N. J., August 27, 1912, by Bolton, a telephone report received at the Museum of another, and a report of a third from Mr. Joseph Mattes.

Mr. Sleight showed his plan for keeping convenient reference copies of descriptions.

Dr. Osburn announced the programme for the next meeting and requested members to write at least the scientific names of species cited verbally during the meetings to facilitate accuracy of minutes.

MEETING OF OCTOBER 15, 1912.

A regular meeting of the New York Entomological Society was held October 15, 1912, in the American Museum of Natural History, at 8.15 P. M., President Dr. Raymond C. Osburn in the chair and seventeen members present.

The President opened the symposium on insects of Aquatic Environment.

Dr. Lutz read the introductory paper, which is not spread upon the minutes, as it, as well as the papers that follow, will be printed in full in the JOURNAL.

Mr. Sleight read a paper on Trichoptera, showing the species referred to in two boxes, one exhibiting the different stages for each species, the other arranged to show graphically the relation between the speed of the current, the character of the case made by the larvæ and the abundance of each species.

Mr. Barber read a paper on Water Hemiptera, in which the modifications of structure and habits of the species were reviewed.

Mr. Barber also mentioned the occurrence of bed bugs in hens' nests in large numbers and stated that, though this has been known to occur before, it was unusual.

Mr. Grossbeck read a paper on mosquitoes, with special reference to environment, in which he not only gave minute details for each species, but also traced the reasons for their individual behavior in oviposition.

Dr. Osburn read a paper on two groups of Diptera, aquatic to some extent in the larval stage, the Tabanidæ and the Syrphidæ.

At the conclusion of Dr. Osburn's remarks the vice-president, Mr. Chas. L. Pollard, assumed the chair as Dr. Osburn was obliged to leave the meeting to keep another engagement.

Mr. Leng read a paper on "Aquatic Coleoptera," in which he referred to the modifications of adults and larvæ and the special environments under which the species live.

Mr. Davis exhibited his collection of aquatic plants, including those that had been mentioned by previous speakers.

Mr. Sherman read a paper on "Aquatic Dytiscidæ," in which the results of his extensive experience in collecting water beetles was summarized, and a

division of their habitats into meadow ponds, woodland ponds, brooks and springs was proposed and illustrated by series of specimens peculiar to each environment.

Mr. Shoemaker exhibited his large collection of water beetles.

Dr. Felt communicated two summaries relating to gall midges and mosquitoes.

Mr. Dow spoke of collecting Corixidæ in the island of Jamaica, where no natural body of water suitable to their development is found, but where nevertheless vast numbers occur and must presumably have adapted themselves to other than their natural environment.

On account of the late hour, the chairman announced that discussion of the papers that had been read would be postponed till the following meeting.

MEETING OF NOVEMBER 5, 1912.

A regular meeting of the New York Entomological Society was held November 5, 1912, in the American Museum of Natural History, at 8.15 P. M., President Dr. Raymond C. Osburn in the chair and eleven members present.

The curator announced that work on the local collection of Rhynchophora would commence on Saturday afternoon, November 9; also that current numbers of all entomological journals, by arrangement with the librarian of the American Museum, would be found on file in the meeting room.

Mr. Maximilian C. Marshall, of No. 3035 Ocean Ave., Sheepshead Bay, L. I., was nominated for active membership. On motion the by-laws were suspended and Mr. Marshall was immediately elected. Dr. Osburn donated a duplicate paper from his library to the library of the Society.

Under the title "Notes on Collecting in the Northwestern States and in the Canadian Rockies," Dr. Osburn described the journey he had made, starting at the end of May from Minneapolis through North Dakota, Montana and Yellowstone Park, to Tacoma, Seattle and Vancouver, returning via Canadian Pacific Railway, with stops at Revelstoke, Kaslo, Kootenay, Glacier, Field and Laggan, illustrating his remarks by photographs thrown on the screen by radi-opticon. Dr. Osburn's visit to the Red River of the North, thirty miles north of Fargo, Dak., was particularly for the capture of *Gomphus cornutus*, and his success will be mentioned in the JOURNAL. In the Yellowstone Park, insects encrusted with lime were found in the hot springs, and will also be mentioned in the JOURNAL. At Kaslo, Dr. Osburn met Mr. Cockle and collected the first day with him on the bluff above Kootenay Lake, and on the succeeding day up stream and partly along line of old railroad, finding *Æshna interrupta* var. *interna* and a species of *Cuterebra*. At Glacier splendid collecting was found on the slopes of Eagle Peak and in a damp mountain meadow where, on July 15, Syrphids were very abundant. The season was rather too early for dragonflies, which would have been more abundant later and up to the middle of August. From Field a side trip was made to Emerald Lake; on the road through a forest of lodge pole pines *Tabanus osburni* Hine, a most pestiferous horse fly, not hesitating to attack humans as well as horses, was very abundant. From Emerald Lake

the Yoho Valley was reached through Yoho Pass and the camp maintained by the Canadian Pacific Railroad near Takaka Falls was visited. Here Syrphids were found in large numbers in the tents, probably attracted by their white walls and torpid from the chilly night air of 4,800 feet elevation and surrounding snow and glaciers. From Laggan Dr. Osburn went to Lake Louise, which he described as the most soul-satisfying spot in the world; there excellent collecting was found on the edge of the lake and in the trails through the woods, where the thick vegetation was often knee deep and even above the head in many places. Notwithstanding the distractions of the scenery, glaciers, snow-clad mountains, lakes and waterfalls, 1,000 Syrphids and 1,500-2,000 insects of other orders were taken on the journey, which will be referred to in greater detail at subsequent meetings.

Mr. Davis exhibited and discussed "A New Cicada from Northeastern America," the description of which will appear in the Bulletin of the Brooklyn Entomological Society, New Series. He also spoke of other species of Cicada, particularly *Cicada pruinosus*, which he said was abundant in a piece of woods near Cape May, N. J., in 1910, but very scarce at the same place and season in 1912, leading to the conclusion that it, like the 17-year locust, takes a number of years for larval growth and consequently appears in broods at regular intervals, the length of which might easily be ascertained by systematic collecting over a term of years in the woods in question. Other interesting species exhibited were *Cicada sayi* var. *australis* from Georgia, a series collected in part by J. Chester Bradley; *Cicada engelhardti*, perhaps a variety of *C. lyriceus*, once supposed to have been confined to the Cumberland region, but recently found near Greenport, L. I.; and the following four from Florida, viz., *Cicada pallida*, found in April in the meager pine woods in the interior of Marco Key; *Cicada hieroglyphica*, occurring at Lakeland March 28 and May 5, 6 and 7 and extending thence north to Lakehurst, N. J., where it appears in June; *Cicada parvula*, found in low vegetation only two or three feet from the ground, occurring north to North Carolina, where Manee says it emerges from the pupal skin in the ground; and *Cicada sayi*, found at Labelle. Mr. Davis said this species did not differ from New Jersey specimens in characters or in song, by which in fact he recognized it at first, and then climbing the tree in which it rested, detected its position by the excited waving of the abdomen and caught it.

Mr. Wintersteiner spoke on "Experiences in Collecting Hydrophilidae" and exhibited a remarkable collection of these water beetles. He mentioned the capture of *Ochthebius foveicollis* on *Myriophyllum* growing in stagnant water in July; stated that *Berosus aculeatus*, distinguished easily by testaceous abdomen, is not uncommon near New York, and gave minute information respecting the habitat and characters of all the local species, many hitherto imperfectly known. This paper will be printed in full in the JOURNAL.

Dr. Osburn read a paper on Odonata, which he stated would be turned over to the publication committee for insertion in the JOURNAL along with one by Mr. Davis on local species.

This paper was discussed by Dr. Forbes and Mr. Davis, particularly in

respect of the bearing of the percentage of salt in the water. Dr. Osburn was satisfied that the relation was physiological and not a matter of food supply. Mr. Davis mentioned frogs as numerous in brackish water in Shinnecock Bay, jumping about in sea lettuce. Mr. Davis also spoke of having noticed a species of *Lestes* laying eggs out of water, depending apparently upon the larvæ falling in when hatched. Dr. Osburn said they were also laid in wet wood.

Mr. Davis spoke of *Hydrophilus triangularis* larvæ nearly full grown in a fountain where water lilies were grown, unable to get out. He had taken several and raised them in damp earth, learning incidentally by personal experience that they are capable of biting.

MEETING OF NOVEMBER 19, 1912.

A regular meeting of the New York Entomological Society was held November 19, 1912, at 8.15 P. M., in the American Museum of Natural History, President Dr. Raymond C. Osburn in the chair and sixteen members and two visitors, Mr. Smith, of Ottawa, and R. E. Snodgrass, present.

Mr. Lewis B. Woodruff, of No. 24 Broad St., New York City, was elected a member of the Society.

The President announced the death of Frederick Blanchard.

Mr. Sherman read an obituary notice which will be printed in the JOURNAL.

The President opened the Symposium on Insects of Moist Terrestrial Environment.

Dr. Lutz read the first paper, defining the environment, and illustrated his meaning by lantern slides. He said that the land through growth and decay of vegetation was continually making inroads upon the water or the water by erosion upon the land, and the scene of the conflict was the environment involved in the evening's discussion. The margins of ponds and streams, swamps, moist meadows, bottoms of deep ravines, any place where it would be difficult to collect without at least damp feet would be included, and it would be possible perhaps to find isolated spots of equivalent humidity even at some distance from distinct bodies of water.

Mr. Grossbeck read a paper on the "Lepidoptera of Moist Terrestrial Environment," pointing out that the selection of the species was rendered more difficult by many being general feeders, and others being at times found upon the upland relatives of the swamp plants on which the species usually fed. The list comprises less than fifty species, out of the total of about two thousand species of Lepidoptera found in this vicinity, but is liable to be ultimately increased, as only about half the species have recorded food plants.

Dr. Forbes, in speaking of the "Lepidoptera of both Moist Terrestrial and Aquatic Environment," said that the first departure from normal terrestrial structures might be traced in the greasy hairs of the salt marsh caterpillar, liable to be floated off flooded lands, and enabled thereby to endure temporary immersion. From this point the development of the aquatic habit may be followed in the Nymphulinæ, through four groups, the first living normally above

water on marsh plants, the second living below water in a case or nest, but breathing air, the third breathing water by tracheal gills and living in still water, the fourth with simple gills in swift-flowing water exemplified by an unnamed species discovered at Ithaca. Dr. Forbes discussed a number of species feeding on strictly marsh plants, including the snout moths, *Scirpophaga* sp., feeding on rushes, *Schanobius* sp., feeding on roots, *Nonagria* with large end spiracles, *Leucania unipuncta*, *Ommatostola* and other salt marsh forms. Referring to the Nymphulinae, he spoke of the fresh leaves of which the cases in which the larva lives below the water are composed, aiding in aerating the water, and the habit of the larva to wriggle every few seconds to change the water. He said that among those with tracheal gills, those that began the life cycle in June would live on the surface of the leaves, and the pupa would be formed there, while the August brood would at first mine the young tender leaves at the root, forming movable cases later, hibernating among the stems and being active as late as November. There is no known fully aquatic imago, but *Nymphula icciusalis* can come up through the water before expanding and apparently must do so. Dr. Forbes exhibited part of the Museum collection, pointing out especially the forms provided with gills and living on *Elodea* and water lilies.

Mr. Barber, speaking of the "Hemiptera of Moist Terrestrial Environment," said the species of Acanthiidae were found along wet shores, also the toad bugs, *Gelastocoris* sp. Their life history is unknown, but they are assumed to be carnivorous. Of the Pentatomidae species like *dubius* and *ligata* feed on marsh plants.

Mr. Davis, commenting on Mr. Grossbeck's list, said that *Pamphila panoquin* was often found upon sea lavender, a plant of moist situations on salt marshes, but that he had found the imagos in some numbers in Cape May County, N. J., at least a mile from sea lavender, among golden rod, introducing some doubt as to its being exclusively an insect of moist terrestrial environment. Similarly, while all Saturnidae are liable to be found in moist situations, witness the great baggy cocoons of *Cecropia* on *Decadon verticillata* (loose-strife), yet they were not so found exclusively, and care should be exercised to avoid drawing false conclusions.

Mr. Grossbeck and Dr. Forbes discussed these remarks; the latter stated that he had found the imago of gill-bearing Nymphulinae a quarter mile from water and considered such adult flight no contradiction of the known larval habit.

Mr. Davis, continuing, spoke of the Orthoptera of places where wet feet might be expected; he said the grouse locust, *Ophelia pelidina*, was pretty regularly confined to places that were quite wet. Of *Schistocerca* the form *rubiginosa* was confined to dry situations, while the form *alutacea* would be found in quite wet places. *Melanoplus bivittatus* was also more often found in wet places. *Paroxya floridiana* and *atlantica* and *Scudderella texensis* were further instances. In *Conocephalus* the species *exilis* is emphatically the marsh species, while the other species inhabit upland meadows, sometimes moist but often dry. *Orchelimum pulchellum* and *Gryllotalpa borealis* and the species of

Tridactylus are also more usual in wet places, but exceptionally found in dry. Mr. Davis made it plain in furnishing these instances of Orthoptera more abundant in moist terrestrial environment, that the association was always in his experience more or less incomplete and properly to be expressed as the usual habitat of the insect, rather than as a necessary result from the characteristics of the environment.

Mr. Davis also showed from his collection of plants some of those referred to by previous speakers, particularly those which by the form of the leaves or by sticky hairs catch insects. The pitcher plant, of which one specimen was eaten by an insect, drew from Dr. Forbes an identification of the insect that had caused the damage, a species of *Exyra*, probably *rolandiana*. In the case of the sundews, abundant at Lakehurst, Mr. Davis showed also some of the insects he had found entangled in the hairs.

Mr. Barber invited some discussion of the limits of the topic, especially in respect of insects feeding upon palustral plants. Dr. Lutz and Mr. Leng spoke on this subject, and it was understood that while generally speaking insects infesting plants should be reserved for the symposium of April 15, yet the introduction of such as exhibited special adaptations for aquatic or hydrophytic environment was appropriate in connection with those subjects.

Mr. Leng read a paper on "Coleoptera of Moist Terrestrial Environment," in which he referred especially to the species of Carabidæ frequenting the shores of ponds and streams, showing for instance that the distribution of the genus *Omophron* was controlled by local environment, while the species *tessellatum* was confined to the sea beach and the species *labiatum* to the more austral parts of our region. Numerous other instances were given to illustrate a similar restriction of distribution by moisture. Mr. Leng also referred to the larva of *Brachinus*, said by Wickham and by Dimmock and Knab to be parasitic on the pupa of *Dineutes assimilis*.

Mr. Harris, being asked to speak of tiger beetles, said that *Cicindela hirticollis* was more addicted to wet burrows for its larva than any other species, having been found on Long Island sand bars in situations inevitably wetted at high tide. *C. marginata* also frequents low banks near tidal streams, but as a whole tiger beetles do not come within the scope of the present subject.

Mr. Pollard spoke of *Orchelimum volentum* at Greenfield Pond, near Wilmingon, N. C., when disturbed, diving, always beneath the lily pads. Dr. Forbes asked if *Thysanura* were not peculiarly insects of moist terrestrial environment.

Mr. Dow said that they lived in such wet places. Mr. Schaeffer said that they would be found in cellars or among wet leaves. Mr. Dow said they should really be divided into two classes, the bristletails being found in drier places than the springtails, which must have wet environment, as their mouths cannot take in food unless it is rotted to an almost liquid consistency.

The President asked Dr. Forbes if the species found on *Nelumbo* would be the same as those found on water lilies.

Dr. Forbes replied yes, that *Pyrausta penitalis* had habits similar to the

second group of Nymphulinae, making a pocket in water lily petioles. *Nymphula maculalis* he knew lived on *Brasenia* as well as on water lilies.

The President asked Mr. Davis what *Conocephalus* would probably be abundant in the extensive marshes at Sandusky, O.

Mr. Davis replied probably *exiliscanorus*, for one might catch *caudelianus* and other species dry shod, as they preferred dryish meadows not nearly so wet as those frequented by *exiliscanorus*.

Dr. Forbes, commenting on Mr. Leng's paper, said it was noteworthy that many Lepidoptera were provided with fossorial legs.

Mr. Schaeffer corrected Mr. Leng's statement that there were two local species of *Elaphrus*, since he had personally taken one specimen of a third, *E. cicatricosus*, at Fort Lee.

Dr. Forbes, supplementing his previous remarks, stated that the true Micropterygidae (*Micropteryx* in Europe and doubtless *Epimartyria* here) feed on moist mosses, where they must be continually wet or partially submerged, the situation being about the same as that of sphagnum. The adult moths are normally found eating pollen of aquatic flowers. He also furnished a list of species infesting the different aquatic plants.

Dr. Osburn said that many Diptera were found in moist terrestrial environment, the larvæ of many Tipulidæ and Tabanidæ living and pupating in mud at the edges of pools, the adults being seen resting often on the water. Many groups of Muscidæ and Syrphidæ also might be included, living in mud and burrowing in rotten wood and fungus.

Dr. Lutz, speaking of the uncertainty as to the precise limits of each environment, said it might be well to state, that xerophytic environment to be discussed on December 17 should include such places as pine barrens of Lakehurst, sand dunes at Rockaway, dry hillsides, and all places too dry to tempt gardening operations. It would be interesting on the assumption that insects abhor absolute dryness, to show how those of the pine barrens, etc., avoid it by burrowing or otherwise. It might prove that such conditions are, however, eminently suited to such an order as Hymenoptera, which have been scarcely cited in the aquatic or hydrophytic discussions. Continuing, Dr. Lutz said that the reason the mesophytic environment stood fourth on the list was that in the evolution of environments, aquatic and moist terrestrial lead to mesophytic by one route, while xerophytic leads to it by another, so that the mesophytic is the climax of the evolution of environments and is appropriately reserved for later consideration. He regretted that in the discussions so far but little attempt had been made to show why a given insect preferred a certain environment and hoped that this phase of the subject might receive further thought.

Dr. Forbes said that in the case of the species of *Leucania* but one was provided with greasy hairs. In the damp conditions of the marshes in which it lives, where presumably the fungus disease, or flacherie, would be especially liable to attack the caterpillars, this species might enjoy a decided advantage on account of the greasy hairs resisting the disease.

Mr. Davis exhibited the walking stick insect, *Diapheromera carolina* Scud-

der, captured by Mrs. Annie Trumbull Slosson at Lake Toxaway, N. C., and said it was easily distinguished from *D. femorata* and *D. veliei* by the form of the male genitalia. The species was described from one male from North Carolina, but was not included in the list of Orthoptera of North Carolina by Sherman and Brimley, Ent. News, November, 1911.

MEETING OF DECEMBER 3, 1912.

A regular meeting of the New York Entomological Society was held December 3, 1912, at 8.15 P. M., in the American Museum of Natural History, President Dr. Raymond C. Osburn in the chair with nineteen members and one visitor present.

The Curator reported continued work on the Geometridæ of the Local Collection, also the results of winter collecting at Ramsey, in company with Messrs. Sleight and Leng, in adding to local records and increasing the series in the Local Collection.

Mr. Engelhardt's remarks on "Lepidoptera from Casco Bay, Me., and the White Mountains, N. H.," were based on observations and insects collected during a two weeks' trip from September 10 to 24 to Portland and Orr's Island, Me., and North Conway, N. H.

At Cape Cottage near Portland, as well as in many of the islands in Casco Bay, deciduous trees and shrubs had suffered from the attacks of the brown-tail moth, *Euproctis chrysorrhæa*, to an extent which gave vast stretches of the landscape an appearance of being superficially scorched by fire. Scattered individuals of adult moths and unhatched egg clusters could still be found, but greatest in number were the colonies of young larvæ already housed in their hibernating tents. Several of the adults of this insect attracted to electric lights were also observed by the speaker at North Conway. Quite numerous on Orr's Island feeding on aspen were the larvæ of *Pheosia dimidiata* and *Smerinthus cerysii* and feeding on bayberry, the larvæ of *Samia columbia*. Extremely common in the dense spruce thickets on this island were the geometrid moths, *Tephroclystis interruptofasciata* and *Mesoleuca immanata*, and less common *Hydriomena contracta*. *Catocala relictæ* and *conumbens* could not be overlooked on account of their numbers. In the suburbs of Portland five and six specimens at a time were counted resting on a pole or tree trunk near an electric light. At North Conway, which may be called the southern gateway to the White Mountains, a grove of magnificent red and white pines conveniently near the hotel received the most attention in the collecting line. On several nights trees were baited for moths and at other times the beating of branches with dry leaves still attached, a favorite resting place for moths during daylight, was resorted to. Both methods gave satisfactory results.

In its diversified character, this region offers exceptional opportunities to the entomologist and botanist. Stretches of typical pine barren extend up the valley, the foothills are clothed with stately oaks, maples and white pines, and these in turn are succeeded by dense forests of spruce in the higher mountains.

Among others the following species of moths were exhibited at the meeting: *Xylina petulca*, *signosa*, *bethunei*, *fagina*, *georgi*, *baileyi*, *thaxteri*, *pexata*, *ferrealis*, *Anytus capax*, *privatus*, *Xanthia flavago*, *Cosmia paleacea*, *Dryobota illocata*, *Euxoa velleripennis*, *Scopelosoma tristigmata*, *Nepytia semiclusaria*, *pellucidaria*. Of the two last named species it was pointed out that *pellucidaria*, originally described by Packard in 1873, but provisionally regarded as a variety of *semiclusaria* in the monograph on this family by the same author, was entitled to specific rank. While both species were found in the same locality, their differences become obvious, even without critical examination upon comparison of the series of about thirty specimens of both sexes taken by the speaker. *Pellucidaria* is a larger insect, wing expanse $1\frac{3}{4}$ in., color deep dusky, head white; *semiclusaria* ranges smaller, wing expanse $1\frac{1}{4}$ in., color pale ashy, head yellow.

Aside from Lepidoptera collecting in other orders gave poor results. At North Conway alder thickets had become completely defoliated by the work of *Haltica bimarginata*, but otherwise no beetles were encountered in large numbers.

Mr. Pollard said that the record of *Samia columbia* feeding on bayberry was of great interest.

Mr. Engelhardt said that its usual food plant was larch, but that there was no larch on Orr's Island.

Mr. Leng exhibited three new varieties of *Cicindela* with their related forms, and spoke of their distinguishing characters, pointing out also the interesting fact that their discovery resulted from the distant journeys made by Dr. Osburn, Mr. Engelhardt and Messrs. Davis and Grossbeck during 1912. The descriptions will appear later in the JOURNAL.

Mr. Bird exhibited *Scolytus quadrispinosus*, its larva, pupa, and work in hickory, resulting after emergence in what he termed "shothole effect." He said that two years were required to kill the tree, during which period the larvæ, working around the trunk, destroyed the bast fibers, producing no external sign until the beetles emerged after pupation. The emergence takes place from the end of June to the middle of July, after which the beetles do not immediately mate, but devote themselves to chewing the base of the leaf petioles, making borings in which the mating takes place about the middle of August. The female then lays eggs in little cells, which are discoverable, being confined to the trunk and larger branches, none in branches less than $1\frac{1}{2}$ in. in diameter. The larvæ hatch about the end of August and may be destroyed by squirting gasoline into the holes leading to the egg cells. Mr. Bird added that the usual professional advice to fell infested trees was idle, as the damage was done by the time the shotholes were evident and the beetles were gone to some other tree, usually one of weakened vitality.

Mr. deVyver spoke of the beneficial results obtained in the Bronx by spraying the trees at the egg-laying period with Barkurol or crude carbolic acid, and added that in company with Dr. Felt he had found the beetles attacked by parasites.

Mr. Dickerson spoke of the serious damage caused by this beetle in Nutley and Paterson.

Dr. Lutz spoke of the taxonomy and habits of *Muscidæ sensu strictu*, illustrating his remarks by drawings and Museum collection of these flies. He dwelt upon the characters by which the species are separated, the median stripe, the venation, the color, etc., and pointed out which species are carnivorous and which inhabit dung, intimating that one species of supposedly coprophagous habits probably attacked the earthworms in the manure. He also referred to species attacking flesh before death, burrowing into wounds, nostrils, etc., and to those particularly associated with cadavers.

Mr. Harris referred to his experience in opening old coffins that had been buried one hundred and fifty years in a vault at Cambridge, and finding half a handful of pupa cases of the cadaver fly. He also referred to the paper by Motter in Volume 6 of our JOURNAL on "Insects Occurring in Human Graves."

Mr. Dow, referring to the curator's remarks on winter collecting, said that he was at Bergen Beach on December 1 and found a very rotten and populous oak log, in which a *Dermestes caninus* was found in a burrow. He did not consider this a case of hibernation, for although it had been freezing weather for many days, the temperature in the log must have been fifty degrees or more. He enumerated twenty species of Coleoptera in imago stage and eighteen in larval stage, besides five lepidopterous pupæ, three dipterous larvæ, three hemipterous insects (*Anasa tristis*, the squash bug, being present in vast numbers), pseudo-scorpions, centipedes, sow bugs, slugs and *Thysanura* as indicative of the excessive population referred to.

Mr. Woodruff exhibited the damselflies, *Lestes uncata*, taken at Bronxville, July 9, and *Enallagma piscinarium* Williamson, taken at Lakehurst May 29, also *Tetragoneuria spinigera*, taken at Litchfield, Conn., June 29.

In reply to Dr. Osburn he stated that the distribution of *Enallagma piscinarium* is more northerly, extending also to the middle west.

Mr. Davis mentioned two New Jersey records for *Tetragoneuria spinigera*, namely, Greenwood Lake, a specimen taken by Mr. Watson, and Newfoundland, a specimen taken by himself May 28, 1910.

MEETING OF DECEMBER 17, 1912.

A regular meeting of the New York Entomological Society was held December 17, 1912, at 8.15 P. M., in the American Museum of Natural History, President Dr. Raymond C. Osburn in the chair and thirteen members present.

The President opened the Symposium on "Insects of Dry Terrestrial Environment."

Dr. Lutz read a paper on the subject, referring particularly to the sandy areas at Lakehurst, where the loose sand supplied an example of an environment characterized by dryness, heat and ease of penetration for digging insects. He referred to the number of predaceous insects to be found there and to the causes of their abundance; to the number of fossorial insects to be found there; and to the southern aspect of the fauna, which in his view was due to

the environmental effect of the sandy soil. Discussing this phase of the subject further, he said that the higher temperature was itself due to the character of the soil, and that if a sandy road could be constructed from Lakehurst to West Point, ending there in a sandy area of some magnitude, the same southern insects would extend their range that much further north.

The paper was discussed by Mr. Davis, Dr. Forbes and Dr. Felt, especially with reference to the sandy area at Karner, west of Albany, N. Y., in which there exists an abundant growth of pine and where, Dr. Felt stated, southern forms also occur, for example, *Sphex speciosus*, the largest of the digger wasps, unknown northward except in such sandy areas.

The inference being that such forms came exclusively from the south, Dr. Forbes said that it was proper to note that the plants of the Connecticut Valley showed associations with western rather than with southern forms.

Mr. Davis added that sandy areas were plentiful in Connecticut and also westward from Albany, as for instance at Amsterdam.

Mr. Leng read a paper on "Coleoptera of Dry Terrestrial Environment," in which he questioned whether beetles could be successfully classified in respect to environment by the division used for plants, and suggested that such factors as food supply, shelter and the wilful behavior of the beetles themselves might prove to be of paramount importance. He pointed out that few were capable of maintaining life in very dry environment, and that those usually sought moisture by burrowing or other expedients, citing the larvæ of Cicindelidæ, the *Scaritini*, etc., as instances in point. He quoted some instances, however, as the Bruchidæ, found in seeds, the Ptinidæ, in old furniture, drugs, etc., the Dermestidæ, in dry animal matter, where life was maintained under exceedingly dry conditions; and finally mentioned the Tenebrionidæ, as a family specially developed in the dry regions of the southwest, whose thickened integuments and other characters suggested a possible adaptation to arid conditions.

Dr. Felt mentioned a fruit jar full of popcorn in his laboratory at Albany for the last ten years, so dry that no mould had developed in all that time, and yet full of *Anthrenus musæorum*, which had been breeding there continuously during the whole ten years.

Dr. Lutz said that in the Museum a vial full of red pepper and sealed with wax had stood for three years continuously infested with *Sitotroga panicea*.

Dr. Osburn recalled a lepidopterous larva living in the cast antlers of a Saharan deer.

Mr. Harris, speaking of Cicindelidæ, said that while they differed materially in the amount of moisture preferred, none was really partial to extreme dryness in the larval stage. Those which seemed to like more or less drought were *limbalis*, *splendida*, *longilabris*, *scutellaris*, *consentanea*, *rufiventris*, *hantzii* and *lepida*, but even these he considered mesophytic in the larval period.

Mr. Davis spoke first of the plants of "Dry Terrestrial Environment," mentioning *Hudsonia tomentosa*, *Opuntia*, and blue bent grasses, as being especially characteristic of such localities. Then taking up the Orthoptera he said some grasshoppers were perhaps in part characteristic of dry localities, as well

as one *Conocephalus* and one cricket. As to the grasshoppers, of which he showed seven species, a cultivated field was really the place where most individuals would occur, few preferring really wet or really dry places. The species shown were:

Spharagemon saxatile, on the exposed lichen-covered rocks at Newfoundland, N. J., Ramapo, N. Y., etc.

Scirtettica marmorata, found in dry sandy places.

Psinidia fenestralis, found in dry sandy places, often with the preceding; the wings of this species are of two colors, yellow and red.

Trimerotropis maritima, occasionally found in dry sandy places inland, as at Lakehurst, Chatsworth and Hornerstown in New Jersey, and, according to Dr. Osburn, on the shores of Lake Erie; the color of this species is in harmony with its environment.

Cercotettix verruculatus, found on exposed rocks like *S. saxatile*, occurs at Dover, N. J.; the specimens exhibited came from Delaware Water Gap; others were found on North Mountain, Pa., with Dr. Lutz.

Schistocerca damnifica occurs not infrequently at Lakehurst, N. J., and further south in dry situations.

Schistocerca alutacea rubiginosa, a small pine barren form of this species, is often quite common at Lakehurst, N. J., in the driest situations.

Conocephalus robustus occurs in meadows, but is also to be found on dry dunes, among the *Hudsonia tomentosa* and tall grasses that grow a little way back from the shore.

Gryllus abbreviatus, often found in the driest situations on barren hilltops and sand dunes, also in cultivated fields, eating tomatoes, but then in small numbers only, this species being one that seldom strays from dry places.

In reply to a question from Dr. Forbes, Mr. Davis added that a dry year was not beneficial to grasshoppers unless preceded by a moist period early in the season, the real benefit to the grasshoppers being the failure of the fungus disease in a dry summer.

This topic being further discussed by Dr. Osburn and Dr. Lutz, it appeared that the greatest development of grasshoppers in species and in individuals was reached in the arid western regions, but that it was particularly a development of the *Ædipodini* (embracing the genera with brightly colored wings).

Mr. Grossbeck said there were few Lepidoptera peculiar to dry situations. *Prionapteryx nebulifera*, which feeds on huckleberry at many stations in the pine barrens and builds a tube under ground and extending seven or eight inches up the stalk, composed of sand grains held together by silken threads, affords an example of special adaptation. Other Lepidoptera exhibit structures adapted to existence in arid regions, such as the corneous protuberances observed in Geometridæ and supposed to serve for breaking through the pupa skin and the baked ground. In *morina*, *glaucina* and *synglorhis* there is also a claw on the fore tibiæ. In *Alcis dislocaria* there is a tibial claw but no frontal protuberance, while in *Canocharis* the frontal protuberance exists without the claw. Mr. Grossbeck also spoke of a small geometer found by Dr. Riley on

herbarium specimens, *Eois ptelearia*, as an example of the driest kind of food for Lepidoptera.

Mr. Davis, referring to *Prionapteryx nebulifera*, said that it occurred also at Yaphank, thus extending its previously known range.

Dr. Forbes spoke of the coloration of the forms of arid regions being distinctive, citing *Hemileuca tricolor* as a typical desert form and the bleached-out forms observed in other desert regions, and *Euxoa detorsa*, *Porosagrotis vetusta*, etc., common in the pine barrens and dominant in light clay-colored forms. *Hypantria cunea*, the fall web-worm, has a variety, *pallida*, which presents similar coloration, making its habits worth discovering. Speaking of structures for breaking through baked ground and dense cocoons, Dr. Forbes said that while he had never seen it done the fact that such structures were infinitely more numerous in species of arid regions and present in fifty to sixty per cent. of the species of Australia were certainly suggestive. He had prepared a list of genera in which this structure was present, and he showed a microscopic mount of the leg of *Lygranthæcia thoreau*, in which the climax is reached in a flattened tibia provided with six broad flattened spines, forming a most efficient digging tool.

Mr. Olsen mentioned *Mutilla* as a characteristic insect of dry places.

Dr. Osburn said that neither dragonflies nor Diptera could well belong to a xerophytic classification, on account of the larval life being either aquatic or spent in sucking juices. He mentioned certain Syrphidæ burrowing in cactus, *Volucella fasciata* in particular.

Mr. Dow stated that *Lasioderma serricorne* preferred to chew the driest tobacco, and the wonder was how it could raise enough saliva to spit out the juice.

Dr. Lutz, criticizing the preceding speakers and particularly Mr. Leng, said that individual species of plants as well as insects were often found in strange environments, and it had been the endeavor of botanists to show that while this was true of individual species it was never so with the societies of species found associated in certain environments; and such he expected would also prove true of insects. He expressed his gratification at the number of special adaptations for dry environment disclosed by the evening's discussion, and suggested that the number might well be increased when the subject had received further study and certain orders not yet touched upon were considered. He agreed with Mr. Leng that in the case of insects factors not considered by botanists would prove of importance, especially food and light, but he doubted if the wilful behavior of insects would be found strongly operative. In the matter of light he cited especially his own experiments with *Drosophila* and stated that their utter inability to avoid flying towards the light was indisputable.

Mr. Davis and Dr. Lutz discussed the case of *Gryllus abbreviatus* and the disputed relationship between it and *G. pennsylvanicus*.

Dr. Forbes spoke of the black and green forms of the pursley worm, *Deilephila lineata*, green when feeding in a tree endwise to the sun with air blowing all around it, black when on bare ground without shelter from the sun.

He said that theoretically the black pigment converts the sun's rays and saves the delicate internal organs from injury, as in the negroes.

Mr. Davis said that two colors were found in the caterpillars of *Sphecodina abbotii*, but no differences could be detected in the adults.

MEETING OF JANUARY 7, 1913.

The annual meeting of the New York Entomological Society was held January 7, 1913, at 8.15 P. M., in the American Museum of Natural History, President Dr. Raymond C. Osburn in the chair, with seventeen members and one visitor, Dr. Frederick A. Lucas, Director of the American Museum, present.

Mr. Harris, for the Nominating Committee, proposed the following candidates for officers for the ensuing year:

President—Raymond C. Osburn.

Vice-President—Charles L. Pollard.

Secretary—Charles W. Leng.

Treasurer—William T. Davis.

Librarian—John A. Grossbeck.

Curator—Frank E. Lutz.

Executive Committee—Charles W. Leng, Edward G. Love; Charles E. Sleight, George P. Engelhardt, E. B. Southwick.

Publication Committee—Charles Schaeffer, Frank E. Lutz, Harry G. Barber, John D. Sherman, Jr.

Delegate to Academy of Sciences—William T. Davis.

There being no other nominations, the by-laws were on motion suspended and the secretary, as instructed, cast an affirmative ballot electing the before-mentioned candidates.

Mr. Bird read a paper on "The Breeding of *Papaipema stenocelis* Dyar Within Our Fifty-mile Radius," in which he stated that this very distinct and striking noctuid, described in our JOURNAL in 1907 from a specimen taken at Baltimore, probably captured at light, was again found by Mr. Buchholz in 1911 at Lakehurst. Knowing the food plants of the other members of the group, he surmised that *stenocelis* would be found breeding in the stem or root of some unfamiliar fern. Accordingly, on July 20 last he visited Lakehurst, and noticing orange-colored frass on the sand beneath a fern (*Woodwardia virginica*), discovered the larvæ feeding in the running rootstocks, which were about as large as a pencil. From these larvæ two specimens were bred, which were exhibited with blown specimens of the larvæ. Mr. Bird called attention to the chitinized plates on the tubercles of the eleventh segment, which he pointed out were larger than usual; and closed by predicting that the metropolis of this species would be found in the vicinity of the Dismal Swamp, and the greatest number of specimens in the month of October.

President Osburn read a paper on "Sexual Dimorphism in Diptera," dwelling particularly on the differences in the form of the head and in the eyes, holoptic in ♂, dichoptic in ♀, and frequently with definitely limited patches of larger facets in ♂. He spoke also of the feathery antennæ of some ♂ Culicidæ,

the modified ♀ mouth parts of blood-sucking species, the expanded front legs of ♂ *Platychnus*, the expanded front and middle legs of ♂ *Pyrophaena*, the expanded first tarsal joint of ♂ Simuliidæ; and the color differences frequently observed in the sexes, the male usually being the more highly pigmented, its yellow markings when present being larger and its metallic color more pronounced. The hairs also, he said, were usually better developed in the male, the spinous hairs stronger, the bristles of the antennæ and the hairs about the eyes usually longer. These differences were, however, not without exceptions, and often were much more marked in one species than in others. The appendages of the legs of ♂ Dolichopodidæ and their amorous dances, described by Aldrich, were mentioned as well as the male modifications of the posterior ventral segment. In closing, Dr. Osburn referred to the various efforts that had been made to explain sexual dimorphism since Darwin's conception of sexual selection became in part necessarily modified; the classification by Cunningham of the structures involved into functions of combat, allurement and the different conditions to which the two sexes are exposed; the theory of Morgan that such structures are in part the product of sex-linked heredity and so appear in only one sex, as foreshadowed by Geddes and Thompson in their expression "outcrops of a male as opposed to a female constitution."

Specimens illustrating the various structures and color differences mentioned were exhibited and further explanations were given during the exhibition.

Dr. Osburn's paper was discussed by Messrs. Angell, Davis and Bagg, and in reply to their questions Dr. Osburn said that in the absence of colonial forms there was no possibility of neuters existing, but that, as suggested by Mr. Davis, undeveloped individuals, as in Membracidæ, might occur, and one would then expect to find intermediate conditions of color. The secondary male characters would naturally come on with the development of sexual maturity. Dr. Osburn also in this connection referred to the higher rate of oxidation stated by Geddes and Thompson to be normal in males of all species.

In reply to Mr. Bagg's question, Dr. Osburn said that the attitude of workers in regard to scientific names for the experimental species resulting from the work of students of evolution and mutation varied; and though such had been applied in some cases to Lepidoptera, he would personally be opposed to such a course.

Mr. Sleight exhibited specimens of inflated larvæ resting in natural poses on the leaves of the food plant, prepared by Mr. Hallinan and said the process consisted in inflating as usual, then filling the larvæ with sand so as to permit of posing them without damage, then drying and pouring out the sand.

Mr. Davis, referring to the unusual warmth of January 6, exhibited a specimen of the moth *Platytena scabra*, found flying in front of his home on Stuyvesant Place, Staten Island.

During the service of refreshments Dr. Lucas read extracts from "The Book of Bugs," by Harvey Sutherland, humorously detailing the estimable and other characters of cockroaches and several members contributed notes on the entertaining features of entomology.

Mr. Wintersteiner contributed local specimens of *Tropisternus mixtus*, *Creniphilus digestus*, and *Berosus aculeatus* to the Local Collection, and a note on the occurrence of *Brachybamus electus* on the water plant *Myriophyllum*.

Mr. Wintersteiner also placed on record the breeding of a species of the Dascyllid genus *Cyphon* from aquatic larvæ. The larvæ were found in March in a stagnant pond at Forest Park, among dead leaves under a tree, and were about ten mm. long. Two dozen were taken home and kept in a glass vessel, but on account of their cannibal habits two only reached maturity; the pupæ were fastened to the glass by threads from the anal extremity and hung head downwards.